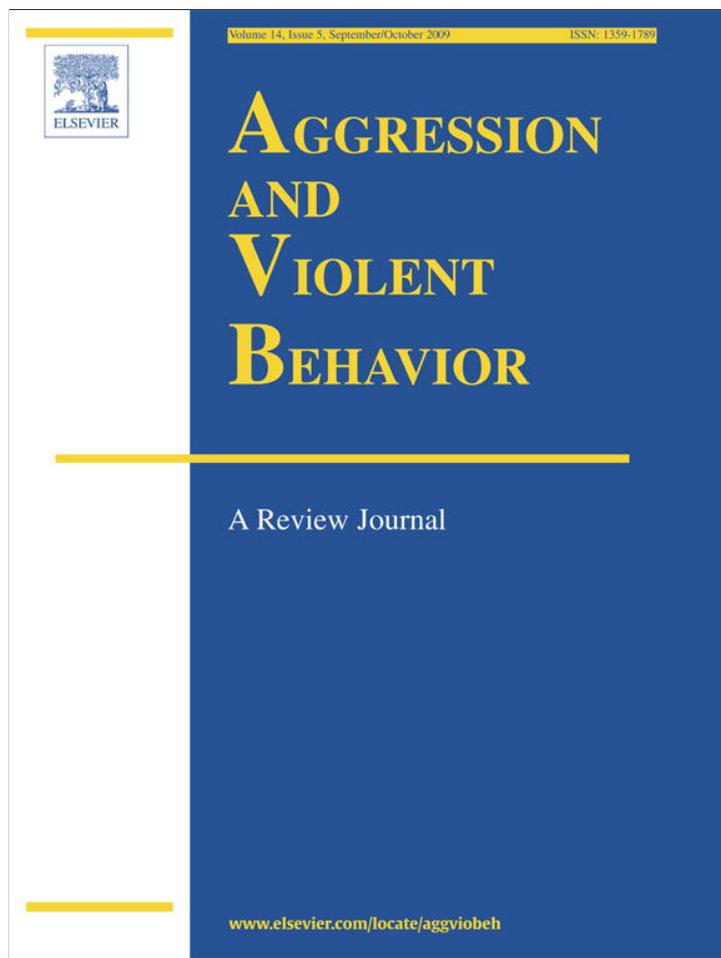


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## Aggression and Violent Behavior



## From steroids to nation states: An integrated evolutionary approach to violent crime

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## ABSTRACT

Most evolutionary psychologists emphasize the individual level of analysis concerning violent crime and other dependent variables. This paper outlines a strategy for evolutionary explanation of societal variation across time as well as space and applies it to crimes of violence. The central idea is that individual adaptations for reproductive competition play out differently depending both on developmental context and societal conditions, including the marriage market. Violent crimes (murders, rapes, and assaults) are substantially *higher* in countries with a relative *scarcity* of men according to research using INTERPOL and World Health Organization data [Barber, N. (2000a). The sex ratio as a predictor of cross-national variation in violent crime. *Cross-Cultural Research*, 34, 264–282, Barber, N. (2009). Countries with fewer males have more violent crime: Marriage markets and mating aggression. *Aggressive Behavior*, 35, 49–56]. This is an apparent contradiction given that males are more criminally violent and likely reflects increased direct mating competition that evokes increased testosterone production for humans as for other species. The empirical evidence is discussed in terms of direct reproductive competition and various alternative explanations, particularly the “culture of violence” and socialization experiences are considered.

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Evolutionary theory can be used to make sense of the great complexity of life assessed from the molecular to the organismal levels, and there is no reason why it cannot also illuminate the causes of variation among human societies (Barber, 2008a; Richerson & Boyd, 2004). Indeed, all of the complexity of human societies must have emerged from the same process of natural selection that shaped the social behavior of other species on planet Earth. Admittedly, most social scientists would enter a caveat here to the effect that recent human societies, at least from the agricultural revolution on, are qualitatively different from other societies due to their complexity, level of tech-

nological development, modes of information transmission, capacity to store food and concentrate power and wealth, etc.

Despite such reasoned objections, the concept of adaptation (when suitable unshackled from a gene-centered approach by including social learning) is useful for analyzing variation in violent crime even in contemporary societies. The remainder of this paper discusses the possible causal mechanisms underlying society-wide adaptationism and uses violent crime rates as an illustrative example.

### 1. The concept of adaptation in relation to modern societies

An evolutionary adaptation is defined as a design-like match between features of the organism and the way that it makes a living (Williams, 1966). For that reason, an adaptation is often thought of as

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providing the solution to an adaptive problem. The long neck of a giraffe solves the problem of reaching into the higher branches of trees where these animals browse. Adaptations must increase biological fitness (or the probability of surviving and reproducing) so that individuals manifesting them are biologically successful and transmit the alleles that underlie them into future generations at the expense of rival alleles. After many generations of such genetic selection favorable alleles get fixed in the population. According to the gene-centered views of adaptation shared by many evolutionary psychologists, an adaptation is found in virtually all members of a species, at least at the appropriate age or developmental stage and if gender appropriate (Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998). This criterion of universality is the first major stumbling block in applying the concept to *behavior*, which is not only contingent upon the immediate context but may also be affected by the developmental environment. This criterion for evolutionary explanation is highly restrictive in that the *current* fitness impact of some characteristic is deemed irrelevant to its status as an adaptation: what is required instead, is a demonstration that the characteristic was selected for over a long enough period in the evolutionary past to drive it to fixation in the species-typical genotype (Buss et al., 1998; Symons, 1992).

It seems clear that these criteria are too stringent to be applied to behavior (as opposed to anatomy that may be studied in the fossil record over millions of years) and that insisting upon them makes the concept of adaptation peripheral to the social and behavioral sciences. Moreover, the argument that selection removes genetic variability with respect to behavior flies in the face of much personality research. Indeed, one can argue that personality variation partly reflects genetic polymorphism that is maintained due to the trade-off between varied fitness costs and benefits associated with the Big Five dimensions of personality, for example (see Nettle, 2006), or individualism versus collectivism (Fincher, Thornhill, Murray, & Schaller, 2008).

Although behavioral adaptations are generally not preserved in the fossil record, we may infer behavioral adaptations indirectly from morphological ones. The evolution of an opposable thumb made possible the fine manipulation of objects leading to widespread tool use among chimpanzees, for example. Similarly, one can infer upright walking from both the structure of the pelvis and the part of the skull through which the spinal column entered. One can also infer the antiquity of some behavior by studying its presence or absence in the genealogical tree of species (the comparative method).

Even profound behavioral changes may leave little impact on the fossil record, however, so that their evolution cannot be traced over long periods of time in the way that comparative anatomists can study the evolving leg bones of horses over many millions of years of gradual adaptive change from a small leaf-browser to a large grazer (Ruse, 1982, p. 127). If behavioral adaptation is to be defined in a way that is useful for social scientists, we must change the definition in ways that are more appropriate for behavior and less tied to anatomical or physiological evolution.

## 2. Defining adaptation in a way that suits socially-learned behavior

In summary, the definition of adaptation taken from evolutionary biology is more suited to phenomena that can be observed over tens of millions of years in the fossil record and is less relevant to behavioral evolution that occurs too rapidly and leaves little or no fossil record for comparative analysis. Moreover, defining behavioral adaptations as species typical is far too restrictive to include socially learned adaptations. Different populations encounter varied challenges to survival and reproduction and behavioral solutions to such problems that are partly dependent on social learning traditions should be considered adaptations because they serve the same function as genetically evolved solutions to the same problem. In either case, an adaptation is defined as a fitness-enhancing phenotype (whether

genetically-based, or learned) that helps an organism to adjust to varied habitats in ways that promote survival and/or reproductive success. The other defining feature of an adaptation, in either case, is that the phenotype is explicitly suited for such adjustment, just as a key is suited to turn a particular lock.

In the past, evolutionary psychologists coped with the lack of a fossil record of behavior in an ingenious, but unsatisfactory, way. They assumed that humans are adapted to the environment of evolutionary adaptedness (or the ecological conditions that prevailed during the two-million-year history of *Homo*) rather than current conditions. Further, they assumed that the brain is composed of numerous special-purpose information processing devices, or modules, each of which was designed to solve some recurrent problem of the remote evolutionary past, such as selecting a mate, detecting cheaters on social contracts, or acquiring language (Cosmides & Tooby, 1987). The structure of these modules was believed to be inherited via a genetic program that was driven to fixation through persistent positive selection so that all humans have essentially the same psychology (with exceptions for gender differences and developmental changes). These assumptions are disputable (Barber, 2008a; Laland & Brown, 2002). Evolutionary psychology has nevertheless stimulated much empirical research predicated on the assumption that if we understood what problems our ancestors faced, and imagined possible components of the relevant solutions (or reverse engineering), that we could conduct tests on modern populations to see whether their minds work as would be predicted using such logic.

It seems preferable that a natural-science approach to our species would focus on observable behavior rather than “the mind” that presupposes subjective self-reports, not to mention a complex system of intervening variables, such as modular information processing mechanisms, that are generally difficult to observe, or to reconcile with known mechanism of neuroscience or gene expression (Barber, 2008a). Moreover, this approach could not be applied to nonhuman animals. By that criterion, it is inherently unsuitable as a natural-science approach and thus falls into a human-uniqueness trap that has bedeviled evolutionary analyses of human behavior over the past century-and-a-half.

In this paper, I argue that in addition to pan-human adaptations, we should also consider that behavioral differences among local populations can be adaptations to local conditions. This logic is quite general and draws on the literature of animal behavior. Examples of socially-learned adaptations include the song complexity of birds, rats specializing on pine cones in some local communities, or shellfish in others, and the Mauritius kestrel developing a novel habit of nesting on cliffs to elude predators (Avital & Jablonka, 2000; Barber, 2008a; Colias & Colias, 1984). The prevailing definition for an adaptation among evolutionary psychologists excludes such phenomena, leaving us with an impoverished account of animal behavior (much less that of humans) in which learned solutions to adaptive problems that make the difference between survival and extinction for individuals, or entire communities, are ignored as irrelevant to adaptation. Consequently, we are left to conclude that most modern human behavior is adaptively neutral or irrelevant. If we are to avoid that conclusion – one that has been all too popular among opponents of evolutionary approaches to human behavior – then we must redefine adaptation in a manner that is more relevant and useful for behavioral scientists whose subject matter is behavior, including criminal behavior, and its underlying biological mechanisms.

Here are the main criteria for a more useful definition of behavioral adaptations:

1. Behavioral adaptations crop up among local populations and do not have to be species typical.
2. Behavioral adaptations need not be observable in the fossil record over thousands of generations to be accepted as valid.
3. Current (or comparatively recent) fitness consequences *are* relevant for defining behavioral adaptations (contrary to the arguments of

Buss et al. (1998) and Symons (1992) among others). At a more general level, it is simply wrong to imagine that human adaptations have been fixed over the past two million years, if only because our ancestry extends back over many different species during that time period who varied in size, habitat, diet, cranial capacity, tool complexity, encephalization, and so on. Phenotypes that enhanced fitness in the evolutionary past may continue to do so, of course, although that is not always true. The human capacity for storing food energy – an adaptation in past environments – causes obesity and metabolic illnesses and is quite maladaptive today, for instance. By the same token, behaviors that enhance fitness today, such as nonviolence, would not have had the same consequence in the past when assaultive violence might have brought immediate benefits rather than swift and long-lasting incarceration. Such changes in the fitness consequences of behavior do not invalidate an adaptationist approach to modern behavior: they make it indispensable.

A formal theoretical model that contemplates societal variation from an adaptationist perspective is known as evolutionary social science (Barber, 2007, 2008a).

### 3. Evolutionary social science

Modern human social behavior can be causally linked to ecological pressures using four necessary key assumptions that form the core of Evolutionary Social Science (Barber, 2007, 2008a). These assumptions are: that modern societies owe their character to an interaction of hunter-gatherer adaptations with the modern environment (*interactionism*); that some changes in societies are due to changes in individuals (*methodological individualism*); that historical changes and cross-societal differences can be due to similar adaptational mechanisms (*counter cultural relativism*); and that different social contexts modify individual development in adaptive ways (*adaptive development*). If any of these assumptions is wrong, evolutionary explanation for societal differences may be impossible.

Each of the above mechanisms is relevant to variation in violent crime. Interactionism means that human adaptations relevant to direct mating effort (which increases violent crime, Minkov, 2009) are influenced by novel economic factors, such as the relative independence of some working women from economic support by their sexual partners, particularly if there are generous state provisions for child care. Decisions of individual women about whether to initiate sexual intercourse prior to marriage affect the pool of women available for extramarital sex which, in turn affect the viability of direct mating effort by men as an alternative to marriage (methodological individualism). Such phenomena can account both for societal differences and for changes in crime rates over time (counter cultural relativism, Barber, 2003a).

Psychologists have often pointed to abusive parenting as a cause of antisocial behavior and crime. Evolutionary social science encourages us to reinterpret such phenomena through the prism of adaptive development. Specifically, one assesses whether parental behavior facilitates the kind of reproductive strategy that is likely to succeed in a particular social context. For instance, children growing up in an urban slum might learn to be tough, suspicious, and street smart as a way of protecting themselves from being taken advantage of by others (Nightingale, 1993).

Given this theoretical backdrop, I argue that most violent crime in modern societies, including modern nation states, is best thought of as one manifestation of ancient adaptations for mating aggression as they play out in varied modern environments. Furthermore, if we wish to understand societal differences in violent crime, then we must investigate factors that influence the level of violence-causing direct mating competition, as opposed to more peaceful indirect competition via marriage and monopolization of economic resources. One critical factor here is the marriage market that affects whether direct,

or indirect, sexual competition is preferred. The marriage market is, therefore, predictive of the level of violent crime in a society.

### 4. Violent crime and adaptive changes in direct mating effort

Even though men are more criminally inclined than women, societies with an excess of men have lower violent crime rates (Barber, 2000a; Walsh, 2003). This phenomenon is counterintuitive, but it reflects a connection between the marriage market and direct versus indirect mating competition between men. If females are scarce relative to males (i.e., sex ratios are high), marriages tend to be more stable (Guttentag & Secord, 1983). Women mostly refrain from premarital sexual intercourse because loss of sexual reputation severely damages their marriage prospects. Given that few women are sexually active outside marriage there is little direct male-male competition over sexual access to females and men compete over spouses rather than sex partners (i.e., engage in indirect mating effort, mediated by monopolizing economic resources and advertising willingness to invest them in a future spouse). In strait-laced sexually-restrictive societies, where women rarely go out alone, there is less reason for men to stay out late at night, or to attend bars. As a consequence, there is less public drunkenness, and fewer violent assaults (Barber, 2009; Guttentag & Secord, 1983; Waite & Gallagher, 2000).

In high-sex-ratio societies, children, and other adults, are less free to do as they please and are more restricted in their sexuality and social activities more generally (Barber, 2008b, 2009; Lim, Bond, & Bond, 2005). By contrast, low sex ratio societies have reduced paternal investment in children (e.g., more teen births and higher single parenthood ratios, Barber, 2002, chap. 9), and greater personal freedom, particularly for women whose sexual behavior is more liberated (Guttentag & Secord, 1983; Lim et al., 2005; Minkov, 2009). These phenomena help explain why the marriage market is functionally related to violent crime.

Countries where the supply of men is low – making it difficult for women to marry – have substantially higher crime rates because there is more *direct* mating effort. Analysis of INTERPOL crime data (murders, rapes, assaults) found that violent crime (murders, rapes, assaults) is a predictable feature of countries with a relative scarcity of men (Barber, 2000a) even with level of economic development and form of marriage (i.e., polygamy) statistically controlled. This result was replicated using two other sources of violent crime data (WHO and UN, Barber, 2009). These results were produced despite controls of every major potential confounding variable known to be associated with cross-national data on violent crimes. Controls included: economic development; polygamous marriage; income inequality; number of police; population density; drug trafficking; urbanization; infant mortality; and world region (Barber, 2000a, 2009). In cross-national data, the sex ratio is one of the largest and most consistent (negative) predictors of various crimes of violence. The same conclusion applies to ecological and time-series research conducted within the U.S. (Guttentag & Secord, 1983; Walsh, 2003).

How can the apparent contradiction of countries having a lower proportion of males reporting *higher* violent crime rates be reconciled? At present, the most plausible interpretation is that countries (or societies) where there is an excess of females favor *direct* mating competition, thereby increasing male-male violence (Barber, 2006, 2009; Minkov, 2009). Conversely, if there is a *scarcity* of females, women are less likely to be sexually active outside marriage, forcing men to compete over *marriage* partners rather than *sex* partners (Guttentag, & Secord, 1983). Such *indirect* reproductive competition usually takes the form of *nonviolent* competition over economic resources that women value in a potential husband (Barber, 2002, chap. 3).

Direct mating effort causes violence (Barber, 2002, chap. 3) through different mechanisms. One reason is that young men vie for social status through violent and reckless actions because loss of social status reduces their desirability to potential mates (see below). Another plausible explanation for the association between low sex ratios and

violent crime is developmental. Various strands of evidence indicate that children are socialized for greater impulse control in high-sex-ratio societies (Barber, 2009; Guttentag & Secord, 1983; Lim et al., 2005; Walsh, 2003). Societies with a more favorable marriage market for women have more stable marriages, for instance, that might favor parental disciplinary consistency and greater impulse control in children. Plausible as this developmental hypothesis is, it receives surprisingly mixed support in the relevant research (Barber, 2006, 2009).

The direct mating competition interpretation receives good evidentiary support, though (Barber, 2006, 2009; Minkov, 2009). Many assaults and homicides occur close to dating locations, such as singles bars, for instance. Moreover, the age and sex of offenders, and victims, implies that they are likely to be reproductive competitors. Criminal violence is thus predominantly a masculine activity and it is more likely to be perpetrated on male victims (Daly, & Wilson, 1988). Although violent male criminals are not necessarily *fighting over women*, men as a group are more prone to damaging physical aggression and this propensity is most parsimoniously explained in terms of an evolutionary history of violent male–male mating competition. Consistent with this view, men are most violent during the years when they are actively dating, a phenomenon that may be partly attributable to peaking testosterone levels although many scholars who lack a comparative perspective dispute this claim (Archer, 2006). UN homicide rates are also strongly related to risk-taking and reproductive competition while individuals in violent societies score lower on social conformity, implying lower indirect (i.e., economic) competition and hence higher mating effort (Minkov, 2009).

Historical evidence also implicates dating aggression as a factor in crimes of violence. According to time-series analyses of violent crimes in the U.S., England, and Scotland, homicides and assaults increased during years when women found it more difficult to marry and were thus more likely to be sexually active outside marriage thereby providing opportunities for direct mating competition between men and associated increases in violent crime (Barber, 2003a). A similar pattern emerges from cross-national comparisons (Barber, 2004a).

Countries in which many women are sexually active outside marriage are liable to have high levels of violent crime. In the Americas, for instance, murders, assaults, and rapes are significantly higher than they are in the rest of the world (Barber, 2006). This difference is statistically explainable in terms of higher proportions of single parenthood in these countries according to careful statistical analyses. Single parenthood is a convenient index of direct mating effort in most countries. In some, such as Sweden, it may not be, reflecting the informality of modern marriage and prevalence of cohabitation there.

Cohabiting women are not single in the sense that they do not date. Casual, or cohabiting relationships – even those that yield offspring – are nevertheless briefer than marriages. More women of reproductive age are thus unpartnered for longer than they would be had they entered permanent marriages. In this environment, men may engage in greater mating effort thereby boosting the potential for conflict with other men occasionally leading to damaging aggression. Knowing that single parenthood ratios are correlated with crimes of violence does not, in itself, permit the drawing of causal conclusions. There are two possible causal interpretations. The first is increased mating aggression due to greater mating effort. The second is that single mothers raise more crime-prone children. Fortunately, it is possible to distinguish between these hypotheses in terms of their differential prediction about the temporal association between single parenthood and violent crime, whether contemporaneous (direct mating), or delayed by a generation (the parenting mechanism).

Analysis of single parenthood ratios allows us to distinguish between parenting effects – that would be delayed by a generation – and direct mating competition that would be immediate. The immediate effect is a great deal larger than the delayed one, indicating that mating competition is a more potent influence on violent crime than

socialization by single mothers is (Barber, 2006, 2009). The mechanisms through which direct mating competition produces violent crime are complex and worth examining as an example of ancestral masculine adaptations for reproductive competition playing out in modern environments.

## 5. How mating competition increases violence

How might adaptations for direct mating competition among men increase violent crime in modern societies? At least three different levels of causation are implicated: sociological, behavioral, and physiological. At the sociological level, patterns of social interaction are pivotal. Wherever sexually active young women may be approached, many men (typically *young* men) are likely to be present. Venues, such as night clubs and bars, experience high levels of male–male violence and account for much violent crime (Peterson, Krivo, & Harris, 2000). The proportion of sexually active young women in a community is itself a function of various factors, including poverty, father absence, reduced parental investment, and so forth, all of which advance the age of sexual activity for females and increase mating effort by males (Barber, 2000a,b,c; Ellis et al., 2003; Quinlan, 2003).

At the behavioral level, violence frequently breaks out at such venues among sexual competitors (or potential competitors) over issues of face. Fights resulting in property damage or injury may be classified by police as “trivial altercations” because the violence appears to lack motivation, emerging instead from minor sources of irritation such as the accidental spilling of a drink. Men who back down in such situations lose status among peers, however, and thereby suffer reduced attractiveness as dating partners given that women are more attracted to high-status males, if not to aggressively domineering individuals as such (Barber, 2002, chap. 4; Daly & Wilson, 1988).

That hot-headedness over reputation is more characteristic of young men pointing to *physiological* adaptations (in the gene-centered sense) – including levels of testosterone and other androgens – that prime males for competition during the phase of their lives when they are most actively competing for mates (Archer, 2006). The connection between masculine hormones and behavior is a two-way street, however: men's testosterone levels are temporarily increased by competitive situations, and even by new sexual relationships (Archer, 2006). Known as the “challenge hypothesis” the notion that males rise to behavioral challenges associated with reproductive competition by increasing testosterone output was first proposed to account not for human behavior, but that of male birds during the breeding season.

Although testosterone is just one of many factors in aggressive behavior, including violent crime, researchers ignore its influence at their peril. Androgens are linked in interesting ways to both mating competition and crime and this helps explain why criminal violence is so common among young males. Thus, young men experience peaks of criminal incidence and testosterone production at around the same ages (Archer, 2006; von der Pahlen, Sarkola, Seppa, & Eriksson, 2002).

Criminal violence is linked to testosterone by other lines of evidence. With marriage, men experience a simultaneous decline in criminal offending *and* testosterone levels (Booth & Dabbs, 1993; Mazur & Michalek, 1998). And this relationship between testosterone and violence may be causal, although true experiments to establish this point would not be practically, or ethically, feasible. Divorce is a natural experiment here. When previously married men begin dating again, their testosterone rises against the normal tendency to decline with age and they become more likely to commit crimes of violence (Mazur & Michalek, 1998). Both the increase in testosterone production and the increase in criminal behavior are associated with a tendency to stay out later at night in bars and other dating venues combined with increased alcohol consumption (Waite & Gallagher, 2000). Although alcohol may *reduce* testosterone production – (resulting in a noticeable feminization of the

appearance of alcoholics, for instance) – it has other effects on the brain, specifically reduced serotonin activity, a neurotransmitter profile that increases the risk of impulsive violence (Norris, Davis, George, Martell, & Heiman, 2002).

The disinhibiting effects of alcohol and other recreational drugs on aggression are widely recognized as a factor in the physiology of violent crime (Giancola, 2002; Norris et al., 2002). Mating aggression is thus aggravated by recreational drug use, helping to explain why dating venues that combine direct sexual competition with drug use can foster violent crime. Trivial-altercation violence between young men can occur anywhere, however. Competitive driving is one example where games of “chicken” occasionally escalate into homicidal episodes of road rage that are a major cause of accidents for young men compared to other demographic groups (Barber, 2002, pp. 294–296). If evolutionary social science improves our understanding of *individual* risk factors for aggressive behavior, what does it tell us about *societal* differences in violent crime?

## 6. Reasons for societal differences in violent crime

Societies with frequent warfare also have higher rates of homicide and assault reflecting adaptive child socialization practices (Ember & Ember, 1994). In subsistence societies that are not at war, the primary motive for homicide appears to be sexual competition among men (Symons, 1979). In other words, one of the most serious crimes of violence emerges from a context of reproductive competition. Sexual competition includes the jealous aggression associated with lovers' triangles where men kill unfaithful spouses as well as sexual competitors (Daly & Wilson, 1988; Symons, 1979). The primary homicide motive of sexual competition is seen around the world among indigenous populations from the !Kung of the Kalahari Desert in South Africa, to the Inuit of North America, the Tiwi of North Australia, the Siriono of Bolivia, and the Arapesh of New Guinea (Symons, 1979, chap. 5). Sexual jealousy is also the primary motive for violence against women in *nation states* around the world (Daly & Wilson, 1988). Leaving warfare aside, direct mating competition is thus the most common cause of homicidal violence in societies around the world whether they are economically developed or not.

The connection between direct mating competition and violent crime has received little explicit attention from cross-societal researchers. Many credible measures of direct mating competition predict violent crimes, however. Violent crime increases with divorce rates among developed countries, for instance (Neapolitan, 1997). This is hardly surprising given that children of divorced parents are much more likely to get in trouble with the law (Hetherington & Kelly, 2002; Wallerstein, 1998). The connection between parental divorce and risk of criminal offending suggests that child-rearing practices affect aggression but genetics could also be a factor. Genetics is clearly not the whole story however, because it cannot account for pronounced increases in crime rates over recent historical time (Barber, 2000c).

The connection between divorce and crime rates is arguably due, in part at least, to the relationship between divorce and sexual behavior. In countries with high divorce rates, many unmarried reproductive-age women are likely to be sexually active following separations and divorces. This provides opportunities for direct mating effort by men leading to increased male–male aggression. Even if a comparatively small proportion of men get involved in brawls, it is also true that serious violent crime is very much a minority phenomenon. A similar logic applies to nations with a scarcity of males. Such nations experience more violence because low sex ratios make it difficult for women to marry thereby boosting premarital sexuality and direct mating effort by men (Barber, 2007).

That a scarcity of men does indeed foster premarital sexuality and extramarital sexuality more generally, is supported by two lines of objective evidence. Both teenage childbearing rates and single par-

enthood ratios (Barber, 2000b, 2001, 2003b, 2005) are higher in countries where there is a relative scarcity of men. Conversely, a scarcity of women, promotes premarital chastity, and an environment where men cannot compete over temporary sexual partners and must compete *indirectly* for permanent mates instead by accumulating wealth or vying for prestige (Guttentag & Secord, 1983).

One can thus make a good case that manifestations of violent crime in modern societies are reflective of adaptations for reproductive competition. This approach is rich in possibilities for future research and helps to integrate the efforts of researchers in many disparate fields of specialization. Before concluding this evolutionary analysis of violent crime, a rival cultural determinist explanation for societal differences is worth considering, namely the “culture of honor” approach that was advanced to explain why violent crime is more common in the South than in the northern U.S. states. This interpretation is widely accepted by leading scholars who mistakenly view it as firm evidence supporting cultural determinism (see Barber, 2008a; Richerson & Boyd, 2004).

## 7. The culture-of-honor interpretation of southern violence

A variety of observations suggest that people raised in southern states of the U.S. have higher violent crime rates, and that southern men are generally more willing to stand up for themselves using physical aggression – a phenomenon that is often referred to as a “culture of honor” (Nisbett & Cohen, 1996). We still do not fully understand why this regional difference exists. Approximately 15 years ago, psychologist Richard Nisbett and others proposed an intriguing explanation in terms of subsistence problems experienced by the original settlers (many from Ireland and Scotland). Lacking the protection of a well-established central government, these settlers were vulnerable to livestock thefts and had to be prepared to protect their property using violence if necessary. Hence, the tendency to cultivate a reputation for manly toughness that served to discourage theft.

Nisbett and Cohen (1996) collected a variety of evidence that appeared to back up their theory that the type of agriculture practiced, specifically herding as opposed to farming, promoted norms and attitudes characteristic of a culture of honor. The problem is that when some of their key evidence was carefully re-evaluated, a very different conclusion was reached (Chu, Rivera, & Loftin, 2000). Chu et al. (2000) investigated the white non-Hispanic male homicide rates in rural counties in the South as a function of the type of agriculture practiced to evaluate the prediction that homicide rates would be higher in counties that were arid and hilly and thus more suitable to herding than farming and, therefore, conducive to a culture of honor. They concluded:

Although we analyze similar data and address the same conceptual issues, we find *no support* for the Nisbett–Reaves hypothesis. Overall, white male homicides in rural counties in the south do not vary as predicted by Nisbett's theory. Moreover, for some estimates of white male homicide rates, when county homicides are adjusted for differences in white poverty, the patterns are *directly opposite* to the Nisbett–Reaves predictions (Chu et al., 2000, p. 972, emphases added).

Although the connection between a culture of honor and type of farming was thus unambiguously debunked, many scholars continue to behave as though the disconfirming evidence had never been published (e.g., Richerson & Boyd, 2004). It is worth pointing out that the Nisbett–Reaves hypothesis was really more of an ecological theory than a cultural one, and thus the right sort of hypothesis to investigate according to the adaptationist approach to societies that is outlined in this paper. The cultural determinist explanation for violence may well have been discredited but this does not, of course, mean that socialization experiences are unimportant to violent crime.

## 8. Violent crime and adaptive development

There is little question that many social contexts are correlated with high crime rates. As noted, some of the important variables are the sex ratio (or marriage market), divorce rates, poverty, single parenthood, and so forth. An evolutionist is interested in discovering why the outcomes are correlated with the social context in this way and the most plausible explanation has to do with variation in reproductive strategies by men (and women). The real question is whether, and how, such correlations fit in with notions about adaptive development, or a socialization process that seems designed to produce children who can be biologically successful in their particular social context.

In general, parents implement socialization practices that are in keeping with societal variation in social and economic conditions (Barber, 2000c, 2007; Low, 1989). Children growing up in agricultural societies are generally encouraged to work hard and conform with social conventions whereas hunter-gatherers are more independent-minded on account of the varied tactics that lead to social, economic, and reproductive, success in these varied settings. The whole focus of adaptive development is to look for predictable input–outcome relationships of this kind and students of violent crime have identified many such associations without placing them in an evolutionary perspective or tying them to varied reproductive strategies.

The quality of home life affects children's risk of committing crimes of violence (Barber, 2000c, 2002), and this fact is reflected in arrest statistics and crime. Violent crime rates are substantially higher for children raised in poverty, children of single parents, and children whose parents have divorced, for instance. And these differences cannot be dismissed as purely an artifact of biased reporting or police discrimination against such high-risk groups (Wallerstein, 1998). Economic disadvantage, whether measured in absolute terms, or as income inequality, increases criminality. Children of poor parents receive less emotional support, are scolded more, and more vulnerable to severe corporal punishment so that they experience greater psychological stress that alters phenotypic development, including brain development. This means that they are pushed in the direction of increased mating effort and reduced parental investment. For females, this means being sexually active outside of emotionally-committed relationships.

Why do children raised in poverty, for example, experience such reduced parental investment? This pivotal question has two answers, an immediate answer, and an ultimate answer that delves into the evolution of human mechanisms of psychological development. The immediate answer involves such factors as insufficient funds to live in a pleasant neighborhood, eat well, buy books and toys, attend good schools; the fact that poor parents are more likely to use hostility and coercion as ways of controlling their children's behavior, and so on (Barber, 2000c, 2002). The ultimate answer addresses the more general issue of why poor parents tend to coerce their children into compliance instead of using a reasoned approach to discipline. Reasonableness generally produces better compliance and has the added benefit of helping children to accept authority in their lives so that they are more obedient and successful in school and in other important social situations throughout their lives (Barber, 2004a,b).

The ultimate, or evolutionary explanation for the connection between rearing experiences and crime begins with the premise that the survival and future reproductive success of children are promoted by different patterns of behavior in different environments. This is hardly controversial and anthropological research confirms that child-rearing practices of different societies differ in ways that tend to promote children's social success (Barber, 2000c; Low, 1989). This means that in a social context that favors mating effort over increased investment in children that children would be socialized in ways that promote success in such an environment. The persistence of corporal punishment as a disciplinary tactic in poor neighborhoods in

Philadelphia despite parenting classes that emphasized the potential harms to children looks like an example of parents preferring to socialize their children for the harsh opportunistic world of the urban ghetto rather than the more empathetic communities experienced by middle-class social workers (Nightingale, 1993).

The evolutionary theory of socialization (Belsky, Steinberg, & Draper, 1991) proposes that a coercive, insensitive style of rearing fosters tough-minded children who look out for their own interests and are indifferent to the needs and suffering of others (Barber, 2002). In our society, children raised with little in the way of warm emotional support are more disposed to mating effort rather than occupational striving. This renders them more likely to commit violent crimes as well as to become crime victims. In general, children raised in psychologically stressful homes are more likely to do poorly in school (Delaney-Black et al., 2002), to be irresponsible in their sexual behavior, and to be more irritable, anxious, and aggressive (Barber, 2000c, 2002; Belsky et al., 1991). Research in animal behavior suggests that the irritability and anxiety are partly due to long-lasting changes in responsiveness of the brain to stress hormones (Kalinichev, Easterling, Plotsky, & Holtzman, 2002).

The other main premise of the theory is that coercive, insensitive, and emotionally distant parental behavior is a feature of social environments where interpersonal toughness is an advantage for children. Life at the bottom of a social hierarchy is difficult and stressful, for example, and people who flourish in this environment must be tough-minded to avoid getting taken advantage of by others. This is the adaptive part of the theory because it explains why harsh parenting is a typical feature of some environments, such as being brought up in a depressed crime-ridden inner city, but not others, such as being raised in an affluent suburb.

In addition to being associated with poverty, coercive parenting and reduced parental investment are correlated with many features of populations that have comparatively high crime rates such as an excess of females in the population; high teen births; high single parenthood ratios; polygamous marriage, and great income inequality (Barber, 2007). Despite the compelling developmental case for why such populations might have higher crime rates, the evidence for parenting effects is surprisingly weak for reasons that require further research. Although scholars have often linked violent crime with single parenthood (e.g., Barber, 2000c; Lykken, 1995), it seems probable that these strong associations are conflated with the immediate effects of direct mating effort. As pointed out earlier in detail, when these two forms of influence are evaluated together, the immediate effect of mating effort tends to crowd out the delayed effects of harsh parental strategies and low parental investment more generally.

## 9. Discussion and conclusions

Violent crime is illuminated by throwing a spotlight on human ancestral adaptations as they play out in varied modern environments. By uniting evidence concerning violent crime with human reproductive strategies, the evolutionary approach elaborated here provides a new perspective for understanding why crimes of violence are so common in some societies compared to others. As we have seen, this approach is not just satisfyingly complete, but turns out to be valuable for empirical research. In particular, it points to new, or neglected, independent variables, such as sex ratios, or single parenthood, that are useful precisely because they tap into variation in the importance of direct mating competition that emerges as the single most important factor in comparative research on violent crime. We know that this assessment is correct because such variables produce the largest and most consistent effects in comparative research. For example, the sex ratio is the largest consistent predictor of cross-national differences in violent crime (Barber, 2000b) and accounts for large ethnic group differences (Walsh, 2003). Moreover, single parenthood, can explain the much higher violent crime rates in countries of the

America compared to the rest of the world. These variables help to explain variation in crime rates across time as well as between societies (Barber, 2003a, counter cultural relativism), and they have more explanatory power than income inequality with which they covary (Barber, 2006, Minkov, 2009).

When applied to nonhuman animals, the role of steroid hormones in aggressive behavior is well established and uncontroversial (Archer, 2006). Although it is more controversial for humans, the weight of the evidence is that direct mating effort increases testosterone production in human males thereby elevating risk-taking and aggression. One can thus go from population-level characteristics, such as sex ratios and marriage markets, to variation in reproductive strategies and consequent feed-forward effects of steroid hormones. In linking up this causal chain, one must realize that violent crime is comparatively rare and that most individuals have a very low probability of behaving aggressively, let alone committing crimes of violence. Even so, the combined contextual, and hormonal, aspects of direct mating competition has enough of an impact at the individual level to push some individuals over a theoretical threshold into committing crimes of violence. As such, it is capable of providing very good prediction of crime rates as they vary between countries, ethnic groups, local communities, or age cohorts.

Many scholars pay insufficient attention to the salient features of the adaptational context and prefer to interpret increasing crime rates in terms of declining moral values, norms of behavior, or other such cultural determinist rationalizations. Yet, this approach lacks scientific credibility because it does not identify clear causal mechanisms (often failing even to distinguish clearly between independent and dependent variables), is unfalsifiable, and suffers from circular reasoning (Barber, 2008a). A culture of violence cannot explain why people commit violent crimes, although this claim is unself-consciously stated repeatedly in the literature despite empirical falsification in respect to regional variation in U.S. homicide rates.

Instead of appealing to cultural determinist explanations that lack formal scientific credibility, it is better to investigate violent crime using a liberalized concept of adaptation that is freed from an exclusively gene-centered approach. Animal behaviorists have long recognized that many of the critical adaptive behaviors of social animals, such as food choice, or nest site selection, are socially learned and that natural selection can act on such behaviors with extraordinary rapidity and without genetic mediation (Avital & Jablonka, 2000). This approach assumes that humans and other animals are biologically predisposed (partly due to gene selection, but also due to social learning that occurs independently of gene selection) to behave in ways that enhance survival and increase reproductive fitness.

A non-gene-centered view of adaptation defines behavioral adaptations as those suited to solving adaptive problems that might otherwise be solved by genetic evolution. A polar bear may stalk seals over the ice and its hunting success is enhanced by stealth – one possible advantage of its hairy toe pads. Humans solve the same problem by moving silently through the water in kayaks that require extensive social imitation for successful construction (Richerson & Boyd, 2004). The non gene-centered approach assumes that natural selection operates directly on the behavioral phenotype. This means that the subpopulation of Mauritius kestrels that learned to prefer cliffs on account of being raised there themselves were favored by natural selection – and became more numerous in successive generations – although there was no genetic variation upon which selection could act. Similarly, there would be a reproductive advantage of direct mating effort for men if they find themselves in societies where large numbers of women are sexually active outside marriage, which is another way of saying that increased mating effort under such conditions is adaptive.

These ideas help explain why violent crime is so common in poor communities and countries where a large proportion of the population is poor. Such contexts provide little opportunity for economic

advancement so that large numbers of men are shut out of the marriage market for economic reasons, compelling young women in their communities to be sexually active outside marriage if they wish to raise children. With increased direct mating effort, one gets a substantial increase in violent crime rates.

The above approach to adaptation is controversial, because it places the gene-centered selection that lies at the heart of modern Darwinism (Williams, 1966) in a more peripheral position. Yet, no one questions the fact that natural selection acts directly on phenotypes and only indirectly on genes. The relevant theory may not be as well developed as that of gene-based selection but there is no doubt that the behavior of animals (including humans) changes their evolutionary trajectory through various mechanisms (see Bateson, 2004; Newman, 2002). If an exclusively gene-centered approach to adaptation can be criticized as being too restrictive, and leaving most modern behavior out in the cold, so to speak, then the approach recommended in this paper is open to the opposite criticism, namely, that it is too liberal and includes too much under the rubric of adaptive behavior. Of course, that is not a problem for those of us who would like to apply adaptationist thinking to modern human societies and variations in social behavior therein. Yet, it could become a problem if it undermined the analytical rigor of the concept of adaptation by making it more difficult to distinguish patterns of behavior that are (a) adaptively neutral, or (b) maladaptive.

Adaptively neutral phenomena are certainly a problem for evolutionists. We cannot explain why some local communities of Native Americans would prefer triangles over rectangles as motifs in their traditional beadwork, for instance; and we may be forced to concede that such instances may be outside the scope of natural science. The same kind of arbitrariness pervades the study of the relation between speech sounds and things signified. Yet, it would be a mistake to consider phonetics as being outside the scope of natural science, if only because the problem of generating effective acoustic signals is shared by birds and other animals and that problem is itself modified by features of the local terrain, by the social system, and by climate (Barber, 2008a; Ember & Ember, 2007).

Not all human social behavior contributes to Darwinian fitness, of course. Prohibiting reproduction, after the manner of the Shakers, is clearly a maladaptive form of religion and one that is quickly removed by natural selection, for instance. A similar point can be made about millenarian religions, such as the Xhosa cattle cult and the Native American rain dancers. The Darwinian failure of such social contracts is not threatening to the general premise that religious contracts may enhance fitness, of course, and it is not difficult to determine empirically whether members of some religion experience reduced fitness relative to comparable groups. By the same token, it is abundantly clear that changing reproductive strategies, as a function of economic opportunities, must be adaptive. If a man has little property, or income, and if these are required for successful marriage, shifting to direct mating effort is clearly an adaptive strategy because it is the only one likely to result in offspring. This benefit is offset by increased risks of violence and has the incidental effect of increasing violent crime.

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